Docket No. 207734 FPS/MMCS/APC

PATENT/OFFICIAL

AUG 1 1 2004 IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

n re Anti-Cation of

Joseph Young J. PAIK

Serial No. 10/665,165

Group Art Unit:

Filed: September 18, 2003

Examiner:

For: FEEDBACK CONTROL OF A CHEMICAL MECHANICAL POLISHING PROCESS

FOR MULTI-LAYERED FILMS

## SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Honorable Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the documents listed on the attached form PTO-1449. It is respectfully requested that the documents be expressly considered during the prosecution of this application, and that the documents be made of record therein and appear among the "References Cited" on any patent to issue therefrom. Copies of any cited U.S. Patents and U.S. Patent Publications are not being submitted in accordance with 37 CFR 1.98(a)(2)(i).

This Information Disclosure Statement is being filed within three months of the U.S. filing date OR before the mailing date of a first Office Action on the merits. No certification or fee is required.

In accordance with 37 C.F.R. § 1.97(g) and (h), the filing of this IDS should not be construed as a representation that a search had been made or that information cited is, or is considered to be, material to patentability as defined in 37 C.F.R.§ 1.56 (b), or that any cited document listed or attached is (or constitutes) prior art. Unless otherwise indicated, the date of

## Serial No. 10/665,165

publication indicated for an item is taken from the face of the item, and Applicant reserves the right to prove that the date of publication is in fact different.

No fee is believed to be required; however, the Commissioner is authorized to charge any deficiency in any fees pursuant to 37 CFR § 1.17 associated with this communication and to credit any excess payment to Deposit Account No. 08-0219.

Respectfully submitted,

WILMER CUTLER PICKERING HALE AND DORR LLP

Scott M. Alter

Registration No. 32,879

1455 Pennsylvania Avenue, NW

Washington, DC 20004

TEL 202.942.8428 SMA/lrm

FAX 202.942.848A

Date: \_\_\_\_

						SHEET <u>1</u> OF <u>4</u>		
INFORMATION DISCLOSURE				ATTY. DOCKET NO.		SERIAL NO.		
CITATION IN AN				007734 FPS/MMCS/APC		10/665,165		
	A DDI IC							
/0	OIPE APPLICATION (PTO-1449)							
/	8)(1.10)	1442)		APPLICANT				
AUG 1	1 1 2004 8			Joseph Young	J. PAIK			
	<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>			FILING DATE GROUP				
TRAC	PEMARKORE			September 18, 2003				
	The state of the s		J.S. PATENT DO				1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
EXAMINER'S		T	T		<u> </u>	<u> </u>	FILING	
INITIALS	PATENT NO.	DATE	1	NAME	CLASS	SUBCLASS	DATE	
	4,957,605	09/18/90	Hurwitt et al.				04/17/89	
	5,240,552	08/31/93	Yu et al.				12/11/91	
	5,369,544	11/29/94	Mastrangelo				04/05/93	
	5,444,837	08/22/95	Bomans et al.				12/29/93	
	5,665,214	09/09/97	Iturralde		<del>-</del>		05/03/95	
	5,695,810	12/09/97	Dubin et al.				11/20/96	
	5,824,599	10/20/98	Schacham-Diamand et al.				01/16/96	
	5,825,356	10/20/98	Habib et al.				03/18/96	
	5,831,851	11/03/98	Eastburn et al.	·			03/21/95	
_	5,838,951	11/17/98	Song				08/28/96	
	5,859,777	01/12/99	Yokoyama et al	I			05/13/97	
	5,871,805	02/16/99	Lemelson				04/08/96	
	5,943,550	08/24/99 Fulford, Jr. et a		1.			03/29/96	
	6,012,048	01/04/00	Gustin et al.				05/30/97	
	6,037,664	03/14/00	Zhao et al.				03/31/98	
	6,059,636	05/09/00	Inaba et al.				07/09/98	
	6,096,649	08/01/00	Jang	-			10/25/99	
	6,100,195	08/08/00	Chan et al.	· ·			12/28/98	
	6,114,238	09/05/00	Liao				05/20/98	
	6,150,270	11/21/00	Matsuda et al.				01/07/99	
	6,157,864	12/05/00	Schwenke et al.	,			05/08/98	
	6,181,013 B1	01/30/01	Liu et al.				03/13/00	
	6,212,961 B1	04/10/01	Dvir			1	02/11/99	
	6,226,563 B1	05/01/01	Lim				09/04/98	
	6,228,280 B1	05/08/01	Li et al.				05/06/98	
	6,237,050 B1	05/22/01	Kim et al.			-	09/04/98	
	2001/0006873 A1	07/05/01	Moore				02/13/01	
			Lopatin et al.				04/21/99	
	6,281,127 B1	08/28/01	Shue				04/15/99	
EXAMINER DATE CONSIDERED						I		

## ATTY. DOCKET NO. SERIAL NO. INFORMATION DISCLOSURE 007734 FPS/MMCS/APC 10/665,165 CITATION IN AN APPLICATION (PTO-1449) APPLICANT Joseph Young J. PAIK FILING DATE GROUP September 18, 2003 U.S. PATENT DOCUMENTS EXAMINER'S **FILING** PATENT NO. **INITIALS** DATE NAME **CLASS SUBCLASS** DATE 6,317,643 B1 11/13/01 Dmochowski 03/31/99 6,339,727 B1 01/15/02 Ladd 12/21/98 03/12/02 6,355,559 B1 Havemann et al. 11/03/00 6,391,780 B1 05/21/02 Shih et al. 08/23/99 6,417,014 B1 07/09/02 Lam et al. 10/19/99 6,427,093 B1 07/30/02 **Toprac** 10/07/99 6,432,728 B1 08/13/02 Tai et al. 10/16/00 6,449,524 B1 09/10/02 Miller et al. 01/04/00 6,455,415 B1 09/24/02 Lopatin et al. 04/16/01 2002/0165636 A1 11/07/02 Hasan 04/24/02 6,484,064 B1 11/19/02 Campbell 10/05/99 6,495,452 B1 12/17/02 Shih 08/18/99 12/19/02 2002/0193899 A1 Shanmugasundram et al. 05/01/02 2003/0017256 A1 01/23/03 06/12/02 Shimane 02/04/03 6,515,368 B1 Lopatin et al. 12/07/01 6,517,414 B1 02/11/03 Tobin et al. 03/10/00 6,528,409 B1 03/04/03 Lopatin et al. 04/29/02 6,537,912 B1 03/25/03 Agarwal 08/25/00 6,580,958 B1 06/17/03 Takano 11/22/99 6,605,549 B2 08/12/03 Leu et al. 09/29/01 6,607,976 B2 08/19/03 Chen et al. 09/25/01 6,609,946 B1 08/26/03 Tran 07/14/00 6,616,513 B1 09/09/03 Osterheld 04/05/01 6,624,075 B1 09/23/03 Lopatin et al. 11/05/02 10/07/03 6,630,741 B1 12/07/01 Lopatin et al. 6,660,633 B1 12/09/03 02/26/02 Lopatin et al. 6,708,074 B1 03/16/04 Chi et al. 08/11/00 6,708,075 B2 03/16/04 Sonderman et al. 11/16/01 6,728,587 B2 04/27/04 12/27/00 Goldman et al. **EXAMINER** DATE CONSIDERED

SHEET 3 OF 4

				SHEET <u>3</u> OF <u>4</u>					
INFORMATION DISCLOSURE				ATTY. DOCKET NO.		SERIAL NO.			
CITATION IN AN					007734 FPS/MMCS/APC		10/665,165		
APPLICATION									
<b>l</b>									
İ	(PTO-1	(449)		Ļ	L DDI VOLLE				
					APPLICANT	DATZ			
				Ŀ	Joseph Young J	. PAIK			
					FILING DATE		GROUP		
				September 18, 2003					
		FOR	EIGN PATEN	T D	OCUMENTS				
EXAMINER'S		5.55			UNTRY CLASS		SUBCLASS	Translation	
INITIALS	PATENT NO.	DATE	CO					Yes	No
J	EP 0 932 195 A1	07/28/99	ED						
			EP				<u> </u>	X	
	EP 1 083 470 A2	03/14/01	EP					X	
	GB 2 365 215 A	02/13/02	GB					X	
	OTHE	R ART (Inclu	ding Author,	Title	e, Date, Pertinent	Pages, Etc	c.)		
	Sun, S.C. 1998. "		Transition Me	etal N	Vitrides as Diffusio	n Barriers	for Cu Metalli	zation.	,,
	<i>IEEE</i> . pp. 243-246.								
j.	Tagami, M., A. Furuya, T. Onodera, and Y. Hayashi. 1999. "Layered Ta-nitrides (LTN) Barrier Film by Power Swing Sputtering (PSS) Technique for MOCVD-Cu Damascene Interconnects." <i>IEEE</i> . pp. 635-638.								
	Yamagishi, H., Z. Tokei, G.P. Beyer, R. Donaton, H. Bender, T. Nogami, and K. Maex. 2000. "TEM/SEM Investigation and Electrical Evaluation of a Bottomless I-PVD TA(N) Barrier in Dual Damascene"								
	(Abstract). Advanced Metallization Conference 2000. San Diego, CA.								
	Eisenbraun, Eric, Oscar van der Straten, Yu Zhu, Katharine Dovidenko, and Alain Kaloyeros. 2001.								
	"Atomic Layer Deposition (ALD) of Tantalum-Based Materials for Zero Thickness Copper Barrier								
	Applications" (Abstract). <i>IEEE</i> . pp. 207-209.  Smith, S.R., K.E. Elers, T. Jacobs, V. Blaschke, and K. Pfeifer. 2001. "Physical and Electrical								
	Characterization of ALD Tin Used as a Copper Diffusion Barrier in 0.25 mum, Dual Damascene Backend								
	Structures" (Abstract). Advanced Metallization Conference 2001. Montreal, Quebec.								
	Kim, Y.T. and H. Sim. 2002. "Characteristics of Pulse Plasma Enhanced Atomic Layer Deposition of								
	Tungsten Nitride Diffusion Barrier for Copper Interconnect" (Abstract). <i>IEIC Technical Report</i> . Vol. 102,								
	No. 178, pp. 115-118.  Elers, Kai-Erik, Ville Saanila, Pekka J. Soininen, Wei-Min Li, Juhana T. Kostamo, Suvi Haukka, Jyrki								
	Juhanoja, and Wim								:
	Layer Deposition"	(Abstract). Ad	vanced Materio	als.	Vol. 14, No. 13-14	1, pp. 149-	153.		
	Peng, C.H., C.H. H								
	Liang. 2002. "A 9 pp. 603-606.	Onm Generatio	n Copper Dual	l Dai	mascene Technolog	gy with Al	LD TaN Barrie	r." <i>IEE</i>	EE.
		Y Zhu E Fis	senhraun and	A K	aloveros 2002 "	Thermal a	nd Flectrical R	arrier	_
	Van der Straten, O., Y. Zhu, E. Eisenbraun, and A. Kaloyeros. 2002. "Thermal and Electrical Barrier Performance Testing of Ultrathin Atomic Layer Deposition Tantalum-Based Materials for Nanoscale Copper								
	Metallization." IEE	EE. pp. 188-19	0.						
	Wu, Z.C., Y.C. Lu,								, and
	M.S. Liang. 2002. "Advanced Metal Barrier Free Cu Damascene Interconnects with PECVD Silicon								
	Carbide Barriers for 90/65-nm BEOL Technology." <i>IEEE</i> . pp. 595-598.								
·	July 25, 2003. International Search Report for PCT/US02/24858.								
	March 30, 2004. Written Opinion for PCT/US02/19062.								
	April 9, 2004. Written Opinion for PCT/US02/19116.								
	April 22, 2004. Off	fice Action for	U.S. Serial No	. 09/	/998,372, filed Nov	ember 30	, 2001.		
EXAMINER			I	DAT	E CONSIDERED				
									ļ

INI	FORMATION DISCLOSURE	ATTY. DOCKET NO.	SERIAL NO.				
CITATION IN AN		007734 FPS/MMCS/APC	10/665,165				
	APPLICATION						
	(PTO-1449)						
	(1 10-1449)	APPLICANT					
		Joseph Young J. PAIK					
		FILING DATE	GROUP				
		September 18, 2003					
	OTHER ART (Including Author, T	itle, Date, Pertinent Pages, Et	<b>c.)</b>				
· · · ·	April 28, 2004. Written Opinion for PCT/US02/19117.						
	April 29, 2004. Written Opinion for PCT/US02/19061.						
	May 5, 2004. Office Action for U.S. Serial No. 09/943,955, filed August 31, 2001.						
	May 5, 2004. International Preliminary Examination Report for PCT/US01/27406.						
	May 28, 2004. Office Action for U.S. Serial No.	09/943,383, filed August 31, 20	001.				
	June 3, 2004. Office Action for U.S. Serial No. 0	9/928,474, filed August 14, 200	)1.				
	June 23, 2004. Office Action for U.S. Serial No. 10/686,589, filed October 17, 2003.						
	June 30, 2004. Office Action for U.S. Serial No. 09/800,980, filed March 8, 2001.						
	July 12, 2004. Office Action for U.S. Serial No. 10/173,108, filed June 8, 2002.						
			-				
			<del></del>				
EXAMINER		PATE CONSIDERED					